CLAIMS

WHAT IS CLAIMED IS:

1. A method for recognizing patterns, the method comprising:

    a lead frame orientation detecting step of setting a first lead eye box and a first lead eye point on a gate of a lead frame through an observation hole of a clamp with a camera and setting a second lead eye box and a second lead eye point on a support bar of the lead frame located on an outer circumference of the clamp, before clamping the lead frame seated on a heater block with the clamp, and determining whether or not the lead frame is seated in an exact first position;

    a lead frame indexing step of setting the first lead eye box and the first lead eye point on the gate and setting the second lead eye box and the second lead eye point on the support bar with the camera, after clamping the lead frame, and determining whether or not the lead frame is seated in the exact first position;

    a Video Lead Locate step of capturing positions of leads of the lead frame and memorizing the positions; and

    a die orientation detecting step of setting die eye boxes and die eye points on two specific areas of bond pads adjacent edges of a die and determining whether or not the die is mounted in an exact second position.

2. The method as claimed in claim 1, wherein, in the lead frame orientation detecting step and the lead frame indexing step, the first lead eye box and the first lead eye point set on the gate are set on one of a plated layer or a dent part formed on the gate.

3. The method as claimed in claim 1, wherein the lead frame orientation detecting step further includes a step of moving the lead frame in axes of X and Y and making a captured picture of the first lead eye box be identical with

36

a memorized control picture completely if the captured
picture is identical with the memorized control picture
within a permitted range.

5   4. The method as claimed in claim 1, wherein the lead
frame indexing step further includes a step of moving the
camera in axes of X and Y and making a captured picture of
the first lead eye box be identical with a memorized control
picture completely if the captured picture is identical with
10   the memorized control picture within a permitted range.

     5. The method as claimed in claim 1, wherein the lead
frame orientation detecting step and the lead frame indexing
step, respectively, further include a step of stopping the
15   operation and waiting for an operator's input if there is a
difference between a captured picture of the first lead eye
box and a memorized control picture beyond a permitted range.

     6. A method for recognizing patterns, the method
20   comprising:
     a lead frame orientation detecting step of sensing a
hole number of a lead frame seated on a heater block and
determining whether or not the lead frame is seated in an
exact first position;
25   a first lead frame indexing step of setting a lead eye
box and a lead eye point on one tie bar of the lead frame
with a camera before clamping the lead frame with a clamp,
and determining whether or not the lead frame is seated in
the exact first position;
30   a second lead frame indexing step of setting lead eye
boxes and lead eye points on two tie bars of the lead frame
with the camera after clamping the lead frame with the clamp,
and redetermining whether or not the lead frame is seated in
the exact first position;
35   a Video Lead Locate step of capturing positions of
leads of the lead frame with the camera and memorizing the

positions; and

a die orientation detecting step of setting die eye
boxes and die eye points on specific patterns adjacent edges
of a die with the camera and determining whether or not the
5   die is mounted in an exact second position.

7.   The method as claimed in claim 6, wherein the die
orientation detecting step sets the die eye boxes and the die
eye points on the specific patterns in the vicinity of the
10   edges located outside of bond pads of the die.

8.   The method as claimed in claim 6, wherein the
specific patterns are pictures, figures, characters or
numbers.
15

9.   The method as claimed in claim 6, wherein the die
orientation detecting step stops the operation and waits an
operator's input if the specific patterns are not located
inside the die eye boxes.
20

10. A method for recognizing patterns, the method
comprising:

a lead frame orientation detecting step of setting a
first lead eye box and a first lead eye point on a gate of a
25   lead frame through an observation hole of a clamp and setting
a second lead eye box and a second lead eye points on a
support bar of the lead frame located on an outer
circumference of the clamp with a camera, before clamping the
lead frame seated on a heater block with the clamp, and
30   determining whether or not the lead frame is seated in an
exact first position;

a lead frame indexing step of setting the first lead
eye box and the first lead eye point on the gate and setting
the second lead eye box and the second lead eye point on the
35   support bar with the camera, after clamping the lead frame,
and determining whether or not the lead frame is seated in

38

the exact first position;

a Video Lead Locate step of capturing positions of leads of the lead frame and memorizing the positions; and

a die orientation detecting step of setting die eye boxes and die eye points on specific patterns adjacent edges of a die and determining whether or not the die is mounted in an exact second position.

11. The method as claimed in claim 10, wherein, in the lead frame orientation detecting step and the lead frame indexing step, the first lead eye box and the first lead eye point set on the gate are set on one of a plated layer or a dent part formed on the gate.

12. The method as claimed in claim 10, wherein the lead frame orientation detecting step further includes a step of moving the lead frame in axes of X and Y and making a captured picture inside the first lead eye box be identical with a memorized control picture completely if the captured picture is identical with the memorized control picture within a permitted range.

13. The method as claimed in claim 10, wherein the lead frame indexing step further includes a step of moving the camera in axes of X and Y and making a captured picture inside the first lead eye box be identical with a memorized control picture completely if the captured picture is identical with the memorized control picture within a permitted range.

14. The method as claimed in claim 10, wherein the lead frame orientation detecting step and the lead frame indexing step, respectively, further include a step of stopping the operation and waiting for an operator's input if there is a difference between a captured picture of the first lead eye box and a memorized control picture beyond a permitted range.

39

15. The method as claimed in claim 10, wherein the die orientation detecting step sets the die eye boxes and the die eye points on the specific patterns formed in the vicinity of the edges located outside of bond pads of the die.

16. The method as claimed in claim 10, wherein the specific patterns are pictures, figures, characters or numbers.

17. The method as claimed in claim 10, wherein the die orientation detecting step stops the operation and waits for an operator's input if the specific patterns are not located inside the die eye boxes.

18. A method of detecting an orientation of a substrate comprising:
setting a first lead eye box and a first lead eye point on an unsymmetrical part of the substrate;
capturing a first picture inside of the first lead eye box; and
comparing the first picture to a control picture stored in a memory.

19. The method as claimed in claim 18 wherein the first picture is completely identical to the control picture.

20. The method as claimed in claim 18 wherein the comparing comprises determining a difference between the first picture and the control picture, the method further comprising moving the substrate to make the first picture be completely identical with the control picture.

21. The method as claimed in claim 18 wherein the setting is performed with a camera and wherein the comparing comprises determining a difference between the first picture

40

and the control picture, the method further comprising moving
the camera to make the first picture be completely identical
with the control picture.

5   22. The method as claimed in claim 18 wherein the
unsymmetrical part comprises a gate.

       23. The method as claimed in claim 18 wherein the
unsymmetrical part comprises a dent part of a gate.

10

       24. The method as claimed in claim 18 wherein the
unsymmetrical part comprises a plated layer on a gate.

       25. The method as claimed in claim 18 wherein the
15   unsymmetrical part comprises a support bar.

       26. The method as claimed in claim 18 wherein the first
lead eye box and the first lead eye point are set on the
unsymmetrical part of the substrate through an observation
20   hole of a clamp.

       27. The method as claimed in claim 18 wherein the
substrate is a lead frame.

25   28. A method of detecting an orientation of a die
comprising:
       setting a first die eye box and a first die eye point
on a specific pattern of the die;
       capturing a first picture inside of the first die eye
30   box; and
       comparing the first picture to a control picture stored
in a memory.

       29. The method as claimed in claim 28 wherein the first
35   picture is completely identical to the control picture.

41

30. The method as claimed in claim 28 wherein the setting is performed with a camera and wherein the comparing comprises determining a difference between the first picture and the control picture, the method further comprising moving the camera to make the first picture be completely identical with the control picture.

31. The method as claimed in claim 28 wherein the specific pattern is selected from the group consisting of a picture, figure, character or number.

32. The method as claimed in claim 28 wherein the comparing comprises determining that the die is mounted in error.

33. The method as claimed in claim 28 wherein the specific pattern is adjacent an edge of the die.